SOLMAX

INSTALLATION GUIDELINE

Geosynthetics used in subgrade stabilization

Contents

1. INTRODUCTION

This document is prepared to help ensure the geosynthetic soil reinforcement, once installed, will perform its intended design functions. To do so, the geosynthetic must be identified, handled, stored and installed in such a way that its physical property values are not affected and the design conditions are ultimately met as intended. This document does not account for every possible construction scenario. However, this document contains information consistent with generally accepted practices of identifying, handling, storing and installing geosynthetic materials for most roadway applications. If you have questions regarding a specific project or encounter conditions other than those described herein, call 888-795-0808. Failure to follow these guidelines may result in the unnecessary failure of the geosynthetic in a properly designed application.

2. MATERIAL IDENTIFICATION, STORAGE AND HANDLING

The geosynthetic shall be rolled on cores having strength sufficient to avoid collapse or other damage from normal use. Each roll shall be wrapped with a plastic covering to protect the geosynthetic from damage during shipping and handling. Each roll shall be identified with a durable gummed label or the equivalent, clearly legible on the outside of the roll wrapping. The label shall indicate the manufacturer's name, the style number and the roll number.

Upon delivery, check the **MIRAFI®** geosynthetic roll labels to verify the correct product has been received. Immediately inspect the geosynthetic to ensure it is free of any flaws or damage that might have occurred during shipping or handling. While unloading or transferring the geosynthetic from one location to another, prevent damage to the wrapping, core, label or the geosynthetic itself. If the geosynthetic is to be stored for an extended period of time, the geosynthetic shall be located and placed in a manner that ensures the integrity of the wrapping, core and label as well as the physical properties of the geosynthetic. This can be accomplished by elevating the geosynthetic off the ground on dunnage and ensuring that it is adequately covered and protected from ultraviolet radiation, chemicals that are strong acids or strong bases, fire or flames including welding sparks, temperatures in excess of 140 F (60 C), and human or animal destruction.

3. GEOSYNTHETIC PLACEMENT AND OVERLAP

Figure 1: Subgrade preparation

Figure 2: Geosynthetic deployment

Clear, grub and excavate (as required) to the planned subgrade or undercut elevation, stripping topsoil, deleterious debris and unsuitable material from the site. The surface of the prepared subgrade should be relatively smooth and level (Figure 1), and depressions or humps greater than 6 in (15 cm) should be graded out (i.e., back bladed/back dragged). To minimize subgrade disturbance over very soft soils (CBR < 1.5%), specialized equipment with low ground pressure, may be required and the use of vibratory compaction equipment should be avoided to minimize disturbance of the existing firmer crust layer. In some cases, it may also be beneficial to leave root mats in place, by cutting stumps and other projecting vegetation as close and even to the ground surface as practical.

The geosynthetic reinforcement shall be placed directly on the prepared subgrade (Figure 2). It should be rolled out flat and tight with no folds or wrinkles. Unroll the geosynthetic in the direction of travel so that the machine direction (i.e., long axis) of the roll is parallel with channelized traffic patterns.

Adjacent rolls should be overlapped along their sides and ends as a function of subgrade strength as follows:

CBR ≥ 3%	12–18 in (30–45 cm) overlap
1% ≤ CBR < 3%	24–36 in (60–90 cm) overlap
0.5% ≤ CBR < 1%	36 in (90 cm+) or sewn*
CBR < 0.5%	sewn*

* Please contact your local Solmax Geosynthetics representative for recommended sewing practices.

If the need for overlaps greater than 36 in (0.9 m) of overlap is reached, it is strongly suggested that the overlap is sewn or otherwise adhered to limit the potential formation of a slip plane between the overlapped panels. Note: very heavy loading and very soft subgrades will also warrant sewn seams instead of overlapping panels. Prior to fill placement, the geosynthetic can be held in place using U-shaped sod staples or simply by strategically placing shovelfuls of the fill to weigh down the geosynthetic. Overlap ("shingle") the geosynthetics in the direction fill will be spread to avoid peeling-back of the geosynthetic at overlaps by the advancing fill, just as shingles on a roof are installed to prevent water flowing beneath the adjacent row of shingles below.

Cut and overlap the geosynthetic to accommodate curves. Cutting may be done with sharp shears, razor knives or handheld power (i.e., "cutoff") saws. Cut the geosynthetic to conform to immovable protrusions, such as manhole covers and vertical utilities.

4. FILL PLACEMENT

Figure 3: End dumping aggregate

Figure 4: Spreading aggregate over geosynthetic

Aggregate fill, as specified, should be placed directly over the geosynthetic in 8–12 in (20-30 cm) loose lifts. Typically, if the design section thickness is ≤ 16 in (40 cm), the entire section should be placed and compacted in one single lift to minimize further degradation of the subgrade. On relatively competent subgrades (CBR ≥ 4%), standard, highway-legal, rubber-tired vehicles (end dumps and belly dumps) may be driven over the exposed geosynthetic at slow speeds (less than 5 mph [8 km/hr]), and in straight paths. These vehicles can dump aggregate fill as they advance, provided this construction traffic will not cause significant rutting upon bare subgrade. Sudden braking, sudden starting/accelerating and sharp turning should be avoided.

Tracked construction equipment must not be operated directly upon the exposed geosynthetic. A minimum aggregate fill thickness of 6 in (15 cm) is required prior to operation of tracked equipment on the geosynthetic. In addition, turning of tracked equipment should be kept to a minimum to prevent tracks from displacing the fill and damaging the geosynthetic.

Over softer subgrades (CBR < 4%), aggregate fill should be end-dumped from the edge of the previously placed material (Figure 3), spreading from the middle outward (Figure 4).

5. COMPACTION

Figure 5: Smooth drum roller

Standard compaction methods may be used unless the soils are very soft (CBR ≤ 1.5%). In such cases, vibratory compaction should be avoided and static compaction with a light smooth drum roller is considered prudent (Figure 5).

Once a stable working platform has been achieved, compact aggregate fill to project specifications, after it has been graded smooth and before it is subjected to accumulated traffic.

6. AGGREGATE FILL CONSIDERATIONS

Preferred (not required) fill gradation for roadway applications is well-graded crushed aggregate fill with a maximum particle size of 1½ in (40 mm) and less than 10% fines (passing #200 sieve). Rounded, sub rounded and sub-angular rock are not recommended for stabilization applications. For unpaved applications, most clean granular fills, including sands are acceptable.

7. INSTALLATION AND REPAIRS FOR UTILITY CUTS

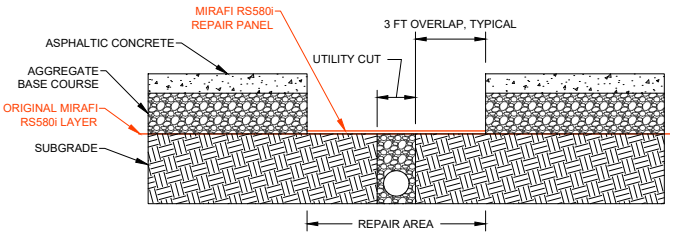

Figure 6: Typical utility cut geosynthetic repair detail (NTS)

Repairs to roadway reinforcement geosynthetics can be made in the field by placing a repair panel or patch over the damaged area. The repair panel should extend 3 ft (0.9 m), typically, beyond the edges of the damaged geosynthetics as shown in Figure 6. Pullout and/or direct sliding calculations should be performed by the project engineer to verify the minimum required overlap length to meet a specific project's requirements.

Figure 7: Extending the geosynthetic reinforcement up a vertical face

When placing roadway reinforcement geosynthetics in trenches or against excavations that terminate at existing curb and gutter, the geosynthetic can be wrapped up the sides of the excavation as shown in Figure 7. Doing so provides extra embedment for the geosynthetic to resist pullout and sliding forces by sandwiching the material between the vertical faces of the existing materials and the newly compacted fill.

About Solmax

Solmax is a world leader in sustainable construction solutions, for civil and environmental infrastructure. Its pioneering products separate, contain, filter, drain and reinforce essential applications in a more sustainable way – making the world a better place. The company was founded in 1981, and has grown through the acquisition of GSE, TenCate Geosynthetics and Propex. It is now the largest geosynthetics company in the world, empowered by more than 2,000 talented people. Solmax is headquartered in the province of Quebec, Canada, with subsidiaries and operations across the globe.

Uncompromised quality

Our products are manufactured to strict international quality standards. All our products are tested and verified at our dedicated and comprehensive laboratories which maintain numerous accreditations. We offer our partners a wide scope of testing according to published standards to ensure products delivered to sites meet specified quality requirements.

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